

Nitrous Oxide Micro Engines, Phase I

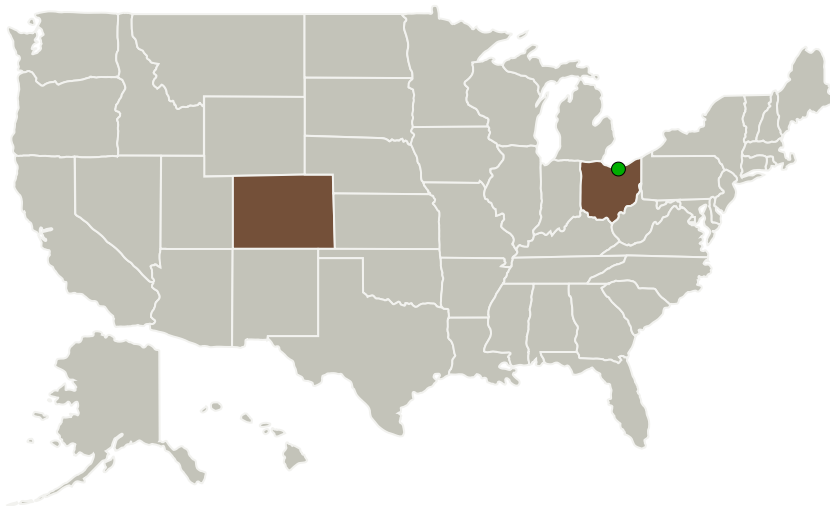
Completed Technology Project (2011 - 2011)



Project Introduction

Nitrous Oxide Micro Engines (NOME) are a new type of nitrous oxide dissociation thruster designed to generate low levels of thrust that can be used for RCS control in large satellites or as main propulsion in micro-satellites. Nitrous is the ideal propellant choice for RCS control in satellites due to the fact that it is non-toxic, non-cryogenic, easily storable, self-pressurizing, and cost effective (unlike monopropellant engines that use hydrazine or hydrogen peroxide which are toxic and/or dangerous, increasing ground costs). NOME engines will have all the desirable features of other monopropellant engines (i.e. simplicity of design, restartable/control on demand, and repeatability) NOME engines will also have a comparable ISP to current monopropellant engines (near 190s) but will be made to achieve greater simplicity and lower handling costs than current systems. NOMEs will have over double the Isp of cold gas reaction control systems.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Pioneer Astronautics	Lead Organization	Industry Historically Underutilized Business Zones (HUBZones)	Lakewood, Colorado
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

Colorado	Ohio
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Project Transitions

**February 2011:** Project Start**September 2011:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138359>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Pioneer Astronautics

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Robert M Zubrin

Co-Investigator:

Robert Zubrin

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Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.1 Chemical Space Propulsion
 - └ TX01.1.7 Cold Gas

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System